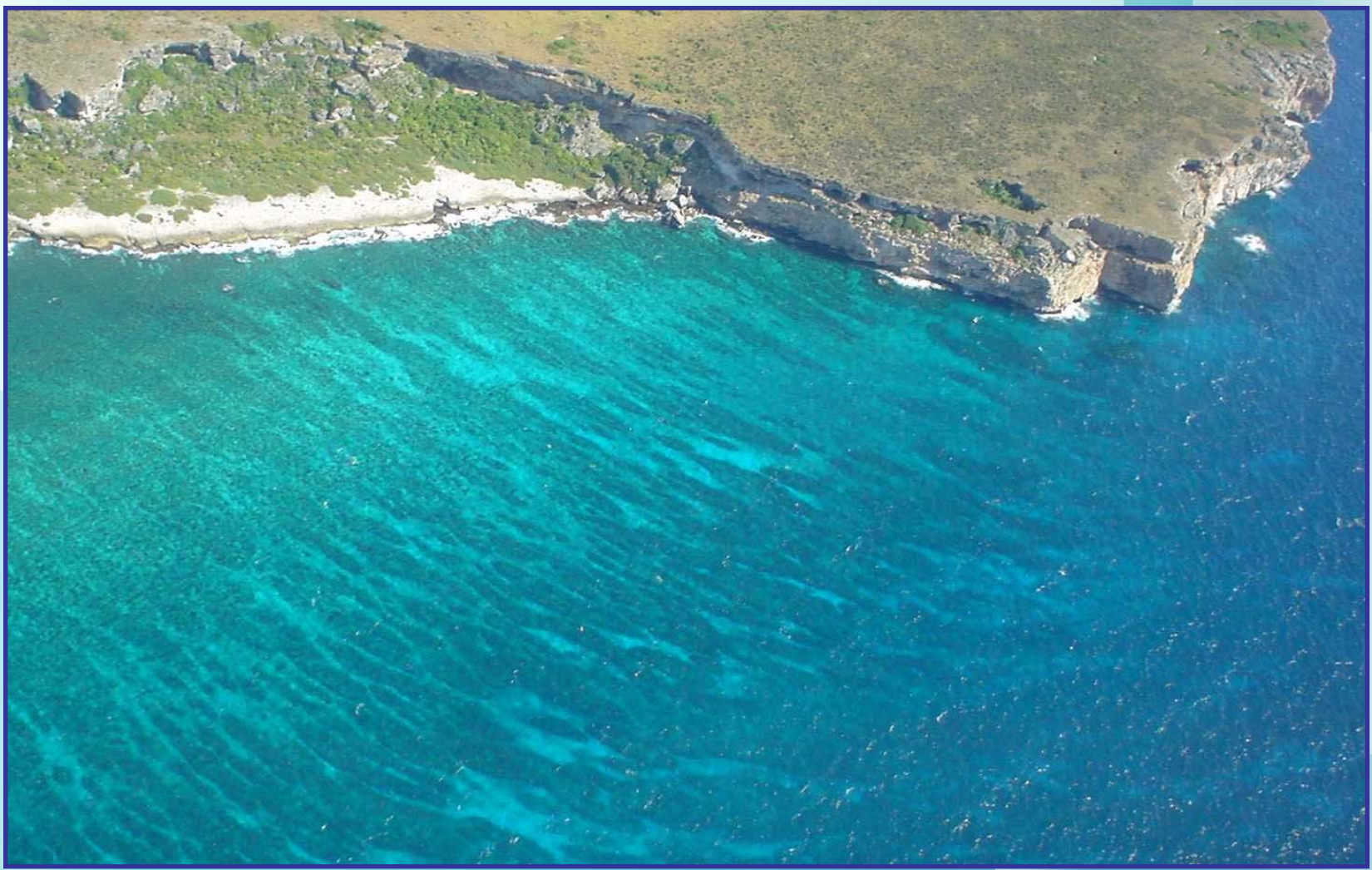
FISH ASSEMBLAGES AND HABITAT CONNECTIVITY FOR MPA DESIGN



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NEED

- **MPA USE INCREASING**
  - **DESIGN BASED ON:**
    - **GOVERNANCE**
    - **COMPLIANCE**
    - **HABITATS**
    - **COMPROMISES**
    - **EDUCATED GUESSWORK**
- **CRITERIA FOR DESIGNING ZONES WITHIN MPAS**
- **MEETING PROPOSED OBJECTIVES**
- **IMPORTANCE OF MPAS AS A CONTROL AREA FOR UNDERSTANDING ECOLOGICAL PROCESSES**

PREVIOUS STUDIES

- **MPA LITERATURE**
  - **FEW EMPIRICAL OR EXPERIMENTAL**
  - **FEW BACIP STUDIES**
  - **LITTLE REPLICATION**
- **HABITAT INFLUENCE ON FISH ABUNDANCES**
- **CONNECTIVITY BETWEEN HABITATS**
- **ONTOGENETIC MOVEMENTS**
- **JUVENILE HABITAT DEPENDENCE**

AIM

- **To better understand the underlying ecological processes that link habitats and coral reef fish species.**
  - **What alternate habitats used by ‘nursery’ species in the lack of submerged mangroves?**
  - **How does the distribution of these habitats influence the distribution of fish around Mona Island?**
  - **How does this distribution affect the effectiveness of the proposed zoning scheme and MPA objectives?**

OBJECTIVES

- **Determine the abundance of specific reef fish species in relation to habitat types.**
- **Assess the distribution of size classes for specific reef fish species.**
- **Identify recruitment habitats and quantify their distribution.**

METHODS

- **BENTHIC HABITAT MAP ANALYSIS**
  - **DETERMINE RANDOM SAMPLING SITES**
  - **A POSTERIORI GROUNDTRUTHING**
- **U/W FISH SURVEYS STRATIFIED BY HABITAT**
  - **ABUNDANCE & DENSITY**
  - **ESTIMATE OF LENGTH & BIOMASS**
  - **25 x 4 m (100 m^2)**
- **BENTHIC HABITAT CHARACTERIZATION**
  - **LINE INTERCEPT**
  - **LARGE SCALE RUGOSITY**
  - **DEPTH**
  - **DISTANCE FROM JUVENILE HABITAT**

HABITAT

- **BACKREEF**
  - **Seagrass**
    - ***Thalassia & Syringodium***
  - **Linear Emergent Reef**
    - ***Acropora palmata, Porites & Montastraea***
- **FOREREEF**
  - **Patch and Spur & Groove**
    - ***Acropora palmata, Diploria & Montastraea***
    - **Octocorals & Sponges**
- **SLOPE**
  - **Pavement**
    - **Octocorals & Sponges**
  - **Linear and Spur & Groove Reefs**
    - ***Montastraea, Agaricia & others…***
- **CLIFF WALL**
  - **Bedrock**
    - **Octocorals & Sponges**

EXPECTED OUTCOMES

- **Spatial distribution of coral reef fish species**
- **Quantification of habitat available and the connection between them for fish species**
- **Detect most probable pathways for fish movement inferred from spatial distributions**
- **Baseline for the evaluation of the effectiveness of the proposed no-take area before implementation**

Proposed No-take Zone